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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,271	09/26/2003	Ralph W. Bruce	NC 83,977	8808

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EXAMINER

MAYES, MELVIN C

ART UNIT	PAPER NUMBER
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1734

DATE MAILED: 07/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/672,271

Applicant(s)

BRUCE ET AL.

Examiner

Melvin Curtis Mayes

Art Unit

1734

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/18/05, 5/16/05.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 14-17 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-13, 18, 21-27, 30-32 and 37 is/are allowed.
- 6) ☒ Claim(s) 19, 20, 28, 29, 33, 35 and 36 is/are rejected.
- 7) ☒ Claim(s) 34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/18/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

(1)

The amendment filed April 18, 2005 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

“materials can be held at this temperature for a short interval” (pg. 5 of marked-up substitute specification). The provisional only provides support for “about 15 minutes”;

“for a short interval” (pg. 11);

“or greater” (pg. 11). The provisional only provides support for approximately 50-100 degrees Centigrade;

“or through some type of forced cooling” (pg. 12);

Applicant is required to cancel the new matter in the reply to this Office Action.

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(2)

The disclosure is objected to because of the following informalities: There are no Figures 8-10 as described in the substitute specification.

Appropriate correction is required.

Claim Objections

(3)

Claims 1, 18 and 33 are objected to because of the following informalities: although the disposing step appears to form a joint area, this is not clear stated. A phrase related to creating a joint area should be added to the disposing step to provide clear antecedent basis for "said joint area." Appropriate correction is required.

Claim Rejections - 35 USC § 112

(4)

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

(5)

Claims 19, 28 and 36 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for heating at 50-100 degrees C per minute, does not reasonably provide enablement for heating at "at least" 50 degrees C per minute. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

The provisional application only describes heating rate of 50-100 degrees C per minute for permitting interdiffusion and interreaction.

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(6)

Claim 20 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for millimeter wave energy of frequency of 83 GHz, does not reasonably provide enablement for frequency of 84.5 GHz. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

The provisional application only describes a 83 GHz gyrotron.

(7)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(8)

Claims 29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 29 recites the limitation "the short interval." There is insufficient antecedent basis for this limitation in the claim. The specification only discloses maintaining at the reactive temperature for about five minutes.

(9)

Claim 33, 35 and 36 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: cooling said joint area to a recrystallization

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temperature, maintaining said joint area at the recrystallization temperature for a predetermined period and cooling said joint area to a temperature below the recrystallization temperature.

According to the specification, recrystallization and cooling are necessary to achieve the desired joint region having similar physical, thermal and electrical characteristics as the base materials.

Claim Rejections - 35 USC § 103

(10)

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

(11)

Claims 33, 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gasse et al. 6,616,032 in view of the "Interference and Guiding Effects in Heating of Ceramic Slabs and Joints with Millimeter-Wave Radiation" article.

Gasse et al. disclose a method of bonding alumina parts comprising: coating the assembly surfaces of the alumina parts with a reactive braze of aluminum, titanium and either palladium or nickel (metal braze which reacts with alumina leading to an interface reaction product); contacting the surfaces; heating to a first temperature to degas the assembly (initial joining temperature); heating to a second temperature above the melting point of the braze (1050-1700°C) for preferably 5-10 minutes (heating to a reactive temperature and maintaining for a period); and cooling to ambient temperature (col. 7-13). Gasse et al. do not disclose heating the coated and contacting assembly surfaces using a millimeter beam focused on the joint area.

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The "Interference and Guiding Effects in Heating of Ceramic Slabs and Joints with Millimeter-Wave Radiation" article teaches that a millimeter wave beam system is usable for rapid heating of joints in ceramics without bulk heating of the material being joined and teaches that a 83 GHz gyrotron beam system can be used to heat a joint filled with reactive metal-filled braze (pg. 287, 297).

It would have been obvious to one of ordinary skill in the art to have modified the method of Gasse et al. for bonding alumina parts using a reactive metal braze by heating the contacting assembly surfaces using a millimeter wave beam system, as taught by the "Interference and Guiding Effects in Heating of Ceramic Slabs and Joints with Millimeter-Wave Radiation" article, for rapid heating of joints in ceramics without bulk heating of the material being joined, as Gasse et al. requires the braze to be heated to a second temperature above the melting point of the braze (1050-1700°C) for preferably 5-10 minutes. The use of a 83 GHz gyrotron beam system would have been obvious to one of ordinary skill in the art, as taught by the article, as useful for heating a joint filled with reactive metal braze.

Allowable Subject Matter

(12)

Claims 1-13, 18, 21-27, 30-32 and 37 are allowed.

(13)

Claim 34 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(14)

The following is an examiner's statement of reasons for allowance: The prior art of record discloses using millimeter wave beam heating and bonding by heating reactive metal braze to melt the braze and then cooling the braze. The prior art of record does not disclose or suggest heating by microwave beam or millimeter wave beam a reactive joining material in the joint area between base materials to an initial joining temperature, where the joining material softens and fills discontinuities, followed by heating to the reactive temperature of the joining material and base materials and subsequent cooling to and maintaining at a recrystallization temperature before cooling to room temperature. In Rokhvarger et al. a blanket is between the microwave waveguide and joint and therefore a microwave beam is not applied to the surfaces being joined nor is the material reactive or recrystallized. Meinhardt et al. and Blake et al. disclose heating to soften and then cooling to recrystallize glass frit for bonding, however this glass frit is not reactive and is not heated from an initial joining temperature for softening to a reactive temperature where it reacts with the materials being joined nor is there suggestion to make this frit reactive or heating it to react. According to the present specification, a joining material which is reactive chemically reacts with the base materials.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

(15)

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

(16)


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234.

The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Melvin Curtis Mayes
Primary Examiner
Art Unit 1734

MCM
July 26, 2005